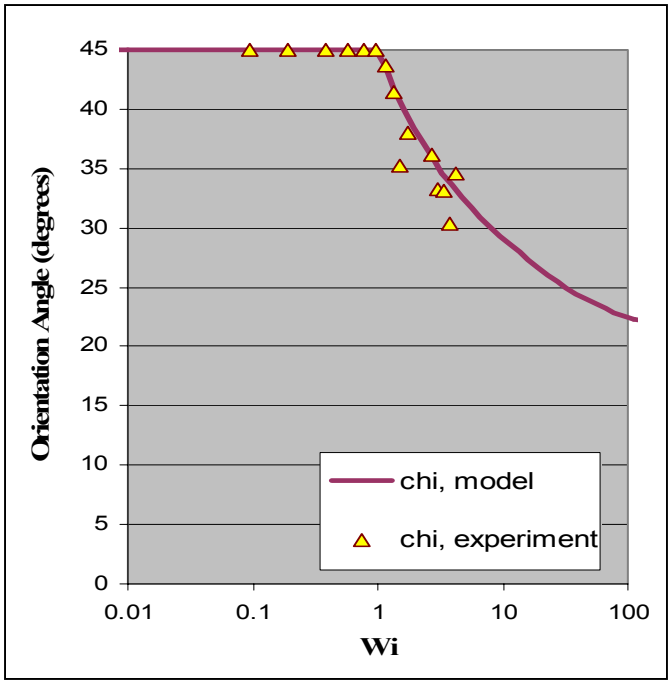
Studies of Entangled Polymers Under Strong Flow Conditions

L.Gary Leal, UC Santa Barbara, DMR-0089124

Both the processibility and the properties of polymeric materials are strongly influenced by the changes in polymer conformation that are induced by strong (processing) flows. This project is currently focused on rheo-optical studies of the dynamics of class of branched polymers that are known as “stars”. We are providing some of the first data that can be used to develop and test theoretical models under strong flow conditions. This data provides some of the clearest direct evidence for recently developed theories of convective relaxation processes, and of the essential similarity of these processes in linear and branched polymers.

Macromolecules, submitted (2004)



Comparison of orientation angle data from a birefringence experiment with a simple theory which incorporates a model for convective constraint release that is adapted directly from a model for linear polymers with no free parameters

Studies of Entangled Polymers Under Strong Flow Conditions

L.Gary Leal, UC Santa Barbara, DMR-0089124

Education:

This grant has supported portions of the PhD thesis studies of three students. One of these students is currently an Assistant professor at the Univ. of Virginia, and the other two are continuing their thesis research at UCSB.